

REMARKS/ARGUMENTS

Claims 49-64, 66-75 and 77-82 are now active in this application, claims 1-48, 65 and 76 having been cancelled. Claims 49 and 69 have been amended to specify that the binder resin is a phenolic resin or carbonization product thereof, and is present in an amount of from 0.01 to 4% by weight. These amendments are supported by the Examples, and the specification at page 27, line 7. Claims 49 and 62-64 have also been amended to correct antecedent basis problems noted by the Examiner. No new matter has been added by this amendment.

The present invention relates to a conductive carbonaceous-fiber sheet which has a thickness of from 0.05 to 1 mm, a weight per a unit area of from 60 to 250 g/m², a bending resistance (L) as determined by the 45° Cantilever method of 6 cm or higher, and an in-plane volume resistivity of 0.2 Ω cm or lower. The conductive carbonaceous-fiber sheet contains a binder comprising a phenolic resin or a product of carbonization of the binder in an amount of from 0.01 to 4% by weight and comprises carbonaceous fibers bonded to one another by surface coating with the binder or its carbonization product.

Claims 49-53, 55-60, 62-64, 66-72 and 74-82 stand rejected under 35 U.S.C. 102 or 103 over Lisowsky. Claims 54, 61, and 73 stand rejected under 35 U.S.C. 103 over Lisowsky in view of Winckler. Claims 65 stands rejected under 35 U.S.C. 103 over Lisowsky in view of Mitchell. None of these references, alone or in combination, can suggest the specifics of the present invention. The present invention requires the use of a binder (required to be a phenolic resin based binder in claim 49) or its carbonization product in an amount of from 0.01 to 4% by weight (cancelled claim 65). Lisowsky nowhere discloses or suggests the use of anything less than 5% of a binder. None of the cited references disclose or suggest the preparation of a conductive carbonaceous-fiber fabric as claimed with the amount and type of binder within the now claimed range of binder. Further,

even if the Examiner deems that the references previously cited would make the invention obvious, there is nothing in the references to lead one of ordinary skill to expect that a conductive carbonaceous fiber fabric as required in the present invention would have the improved properties seen, as demonstrated in Table 1 of the present application. As shown in that Table, when the amount of binder or carbonization product of the binder is limited to from 0.01 to 4% by weight, the combined properties including volume resistivity, bending resistance, fluff grade of carbon fiber sheet, and gas permeability are significantly improved overall compared to use of higher amounts of binder or the absence of binder. (Applicants note that Examples 6-9 of Table 1 are no longer within the range of the present invention).

Thus, the present invention can be regarded as an improvement invention.

Mitchell (US 4,396,663) describes a carbon composite article having a binder present in an amount of from 1 to 15% by weight. However, there is nothing within Mitchell to suggest that that one can limit the binder to be from 0.01 to 4% by weight and form a conductive carbonaceous fiber sheet having the improved properties shown by the present invention in Table 1. In fact, as shown in Table 1, when the amount of binder is 7.9% (just above the maximum allowed by the present invention, but still within Mitchell's range), the resulting sheet has significantly reduced gas permeability relative to the present invention. Accordingly, it is not believed that Mitchell can be used to render the present invention unpatentable even in combination with Lisowsky.

Claims 48 (49?) -60, 63 and 65-82 stand rejected under 35 U.S.C. 103 over Muraki et al in view of Suzuki. Claim 61 stands rejected under 35 U.S.C. 103 over Muraki et al in view of Suzuki, further in view of Holzl et al. However, none of these references disclose or suggest the use of a phenolic resin or its carbonization product as a binder in a carbonaceous-fiber sheet or fabric, particularly with the other requirements of the present invention for the sheet, and the amount of binder being from 0.01 to 4% by weight. Each of Muraki et al and

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Suzuki specifically relate to the use of an epoxy based binder, and Holzl et al makes no mention of binder at all. As such, these references cannot render the present invention obvious and the rejections should be withdrawn.

The rejections under 35 U.S.C. 112 have been obviated by the present amendments.

Applicants submit that the application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



J. Derek Mason
Attorney of Record
Registration No. 35,270

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)